

PROGRESS OF MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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Joint Affections in Scarlet Fever.—HOMA (*Wiener klin. Wochenschrift*, 1901, xiv., 281), during five and a half years in the Hospital for Contagious Diseases in Brunn, observed 506 cases of scarlet fever, in 14, or 2.8 per cent., of which there were complicating joint affections. These came on at the end of the first week five times; at the beginning of the second once; at the end of the second week four times; in the third week three times, and in the fourth week once. The onset occurred with a rise of temperature if fever were not already present, and tenderness and swelling of the joints. In the cases which did not end fatally from other complications or from the severity of the infection, the symptoms diminished in a few days. In six cases there occurred one, in one case two relapses. The joints of the hand were affected eight times, twice on both sides; the elbow-joint seven times, twice bilaterally; the knee-joint five times, four times bilaterally; the ankle-joint four times, twice bilaterally; the shoulder-joint and hip-joint each once. As a rule, various joints were affected at the same time. In one of these fourteen cases only was there suppuration. The treatment consisted mainly of rest, the application of Prießnitz's bandages, and, in four cases, salicylate of sodium internally. All but two of the cases were of moderate or extreme severity, other complications being present.

He concludes that joint affections in scarlet fever belong to the rather frequent complications; that in most cases they begin as an acute synovitis, with fever, pain, and swelling, the latter of which may be absent. Suppurative forms are rare. The onset occurs usually in the first or second week—that is, at about the beginning of desquamation—and the hand, elbow-, knee-, and hip-joints are those more commonly affected. The joint affections are usually multiple, and, occasionally, relapses follow. Endocarditis may occur, and is probably caused by the poison of scarlet fever, as is the

synovitis. With rest, immobilization, and Priessnitz's bandages recovery occurs in a few days. Salicylic acid appeared to have no especially favorable influence. Even purulent synovitis may end in recovery.

Frequency of Typhoid Bacilli in the Blood.—For many years subsequent to the discovery of bacillus typhosus by Eberth, in 1880, the attempts to cultivate the organism from the blood proved almost invariably negative. Subsequently a few isolated cases of typhoid septicæmia were reported. Wissokowitsch found that bacillus typhosus, when injected into the general circulation of animals, soon disappeared from the blood and found lodgement in various organs, particularly the liver, spleen, and bone-marrow. These observations led to the general view that the typhoid bacillus entered the general circulation only rarely and very quickly disappeared.

Subsequent bacteriological researches have shown that this view is incorrect, and that typhoid septicæmia is comparatively common. The early negative results were due to the failure to recognize the germicidal properties of the blood. The cultures were made with undiluted blood, and the concentrated bactericidal substances contained in it prevented the growth of the bacilli. Kühnau was the first to take this property of the blood into consideration in making blood cultures in typhoid. He diluted the blood in 50 c.c. of bouillon and immediately plated. His report in 1897 gave eleven positive results during life in forty-one cases.

COLE (*Johns Hopkins Hospital Bulletin*, July 1901, p. 203), by a slight modification of the technique, has obtained even better results. From 8 to 10 c.c. of blood is obtained from one of the veins at the elbow after thorough disinfection of the part. No incision of the skin is made. The blood is immediately diluted in bouillon contained in Erlenmeyer flasks, about 150 c.c. of bouillon being used in each flask. From one to six such flasks were used for each culture, the dilution being from 1:75 to 1:150. The flasks were then well shaken and placed in an incubator for twenty-four hours, after which, if the bouillon were cloudy, agar plates were made. The organism was identified by its usual characteristics, including its property of agglutination with typhoid blood-serum. With this technique a positive result could be obtained in thirty-six hours.

Cultures were made in fifteen cases of typhoid, with positive results in eleven, which is a large percentage. The earliest day on which the organism was isolated was the sixth. In five cases the blood cultures were positive before the Widal test was obtained. The latest positive result was on the twenty-seventh day. Schottmüller reports having obtained positive results in forty out of fifty cases, and Unger in seven out of ten cases.

The importance of the taking of blood cultures in typhoid, considering these results and the fact that the Widal reaction is delayed in many cases, cannot be over-estimated in making a diagnosis of the disease.

Two Examples of Bence-Jones' Albumosuria Associated with Multiple Myelomata. A Preliminary Report.—HAMBURGER (*Johns Hopkins Hospital Bulletin*, February, 1901, p. 39) reports two cases in which the urine was shown to contain the so-called Bence-Jones bodies. In one case there was strong evidence and in the other positive evidence of the existence of

multiple myelomata of the bones. The chemical reactions of the urine, which are characteristic of the presence of the Bence-Jones bodies, were practically identical in both cases, and the same description will serve for both. Heated to a temperature of 55° to 56° C. a heavy white precipitate fell. This redissolved in part on boiling and returned on cooling. Nitric acid caused a heavy ring which disappeared on boiling and also returned on cooling. The biuret reaction was marked. The proteid content in both cases was fairly high. In one case Esbach's albuminometer showed 0.27 per cent., and in the other from 0.3 to 0.6 per cent. In one case the proteid substances were precipitated with ammonium sulphate, and the precipitate was washed with water. The filtrate gave a definite biuret reaction, thus demonstrating the albumose character of these bodies.

The first case was in a woman, aged forty-nine years, a patient of Dr. Iglehart. The latter found that the urine presented reactions which differed from those presented by albumen. On analyzing the urine Hamburger recognized the reactions as being those characteristic of the Bence-Jones bodies, and suggested that the patient probably had some bone affection. It was then recollected that the patient had suffered intense pain over the left ninth rib. Subsequently the appreciable swelling appeared on this rib near the costo-chondral junction.

The second case was a colored woman, aged fifty years, who was under treatment in the medical wards of the Johns Hopkins Hospital while the first case was under observation. For a year she had suffered pain in the region of the right hip-joint. On admission there was a tumor the size of a child's head in this situation. There were tumors of the left acromion process, both clavicles, and one the size of an orange over the occiput. This patient eventually died, and at the autopsy multiple myelomata were found in the above situations. The histological report of the tumors is not given in this paper.

The Bence Jones bodies, which give the chemical reactions noted above, were first described by Henry Bence-Jones in 1847. The association of the reactions with changes in the bones was noted by him in this first case. The patient died, and Bence-Jones states that on "the following day I saw that the bony structure of the ribs was cut with the greatest ease, and the bodies of the vertebræ were capable of being sliced off with a knife." The condition was designated post-mortem as "*osteomalacia fragilis rubra*."

During the fifty years following Bence-Jones' observation only four cases of albumosuria associated with primary bone disease appeared in the literature. In the past three years eight additional cases have been recorded. In eight of the thirteen cases the autopsy disclosed neoplasms which could be classified as myelomata. In two cases the tumor was visible. In the remainder there was no record of a post-mortem inspection. The cases of Fitz and Askanazy are not included in this list. Fitz's case occurred in a woman with myxœdema, and Askanazy's in a patient with lymphatic leukemia.

The exact nature of the Bence-Jones bodies has not been accurately determined. They are believed to be very closely related to but not identical with albumose. The origin of the proteid is also obscure. It has been found isolated both from the blood and bone-marrow.

The nature of the bone tumor is discussed at considerable length. The name "multiple myeloma" was first applied to the tumor by Rustizy. The tumor does not correspond to the usual conception of malignant neoplasms in the Cohnheim sense, owing to the fact that they probably never metastasize. In the gross these tumors form masses of soft reddish tissue of various sizes, often ill-defined, replacing the normal marrow and osseous substance. The sternum, ribs, vertebræ, and skull are especially prone to the affection. The tumors may or may not appear on the exterior. The bones become softened and are apt to suffer pathological fractures. Many of these cases are mistaken for osteomalacia, but albumosuria has never been found in the latter disease, so that the examination of the urine practically suffices to differentiate the diseases. Histologically in a majority of instances the structure of the tumor has been that of a round-celled sarcoma. Wright, who studied a myeloma in detail in connection with Fitz's case, found that the tumor elements consisted of a variety of plasma cells and believed that they originated in the plasma cell of the bone-marrow.

Dr. Welch, in discussing Hamburger's paper, drew attention to Wright's work as being the most recent contribution to the pathological anatomy of multiple myelomata. The myelomata were not to be considered tumors in Cohnheim's sense, and the nodules are not to be regarded as metastatic tumors secondary to a primary one. If future observations show that the tumor cells are predominantly plasma cells, as found by Wright, the tumors will belong to the class of new growths first designated by Unna as plasmomata.

The Relation of Diabetes Mellitus to Lesions of the Pancreas.
Hyaline Degeneration of the Islands of Langerhaus.—OPIE (*The Journal of Experimental Medicine*, March 25, 1901, vol. v., No. 5, p. 527) refers to a previous paper of his, which has already been reviewed in this department, in which he strongly suspected as a result of a study of a series of cases of chronic interstitial pancreatitis that where diabetes mellitus existed with this lesion, it was due to degenerative changes in the islands of Langerhaus. In the present paper he reports the study of a case of diabetes mellitus in which the pathological findings were such that we can now say with certainty that cases of pancreatic diabetes are due to lesions of the islands of Langerhaus embedded in the gland.

The patient was a colored woman, aged fifty-four years, in whom symptoms of tuberculosis began to manifest themselves about eleven months before her death. Several months afterward symptoms of diabetes mellitus manifested themselves. On admission to the Johns Hopkins Hospital she was found to be suffering from advanced pulmonary tuberculosis, and the urine contained from 4 to 5.4 per cent. of sugar. The patient died several days after admission.

At the autopsy advanced pulmonary tuberculosis was found. The liver, spleen, and kidneys showed nothing of especial note. The brain was removed and found to be normal.

The pancreas weighed 80 grammes and measured $23 \times 5 \times 1$ cm. It was readily dissected from the surrounding tissues. It was soft in consistence, and on section had a gray-yellow color. Histological study of the gland

showed no generalized increase of the interstitial tissue, but here and there, particularly in the tail of the organ, the fibrous stroma showed some proliferation. The normal secretory glandular epithelium was practically normal, beyond some small areas where post-mortem digestion had occurred. In striking contrast, however, was the condition of the islands of Langerhaus. These showed most extensive hyaline degeneration. Only rarely was an island found in an unaltered condition. Some islands showed only partial destruction, while many showed complete destruction by the degenerative process. The hyaline metamorphosis was limited strictly to the islands of Langerhaus, the glandular acini remaining intact. In specimens stained in eosin the islands stand out very conspicuously, as the hyaline material takes a deep eosin stain.

Opie discusses hyaline degeneration at length from a pathological standpoint, and refers in detail to the staining properties of hyaline material.

The writer considers this case of great importance from the stand-point of etiology and pathology of pancreatic diabetes. In his previous study he had endeavored to demonstrate that in diseases of the pancreas associated with diabetes mellitus the islands of Langerhaus were always seriously involved. In the present case which he reports there was no demonstrable pathological lesion outside the pancreas to which the diabetes could be attributed. Even in the gross the pancreas looked practically normal, but microscopic examination demonstrated that the pathological lesions were absolutely localized in the islands of Langerhaus.

Opie's concluding words briefly sum up our latest knowledge concerning pancreatic diabetes toward which he has contributed such valuable information. He says: "Destruction of the pancreas in animals and in man is accompanied by diabetes; in the present case destruction of the islands of Langerhaus has been accompanied by this disease. Since diabetes is absent, when as a result of duct destruction, the secreting portion of the gland undergoes great alteration, though the islands are spared, the conclusion is justified that it is those structures which influence carbohydrate metabolism. What has been learned concerning the action of the pancreas to diabetes is the relation of the islands of Langerhaus to this disease."

The Pathology of Active Tuberculosis of the Pericardium.—WELLS (*Journal of the American Medical Association*, May 15, 1901, p. 1451) has made a careful study of tuberculosis of the pericardium, the work being based on the examination of ten cases which occurred in a total of 1048 autopsies performed at Cook County Hospital.

The writer emphasizes the point that pericardial tuberculosis is not nearly so uncommon as generally supposed. It occurs in about 1 per cent. of his series. Of the 1048 autopsies, 364 presented distinct tuberculous lesions elsewhere than in the pericardium, of which 208 were active. In all the bodies with active tuberculosis, therefore, about 5 per cent. presented active tuberculous lesions in the pericardium. In the entire series the pericardium was found affected in some way in 128 cases; of these, the ten cases of tuberculous pericarditis constitute nearly 8 per cent. Tuberculous pericarditis is very likely to occur in the young.

Anatomically tuberculous pericarditis may occur (1) as an acute miliary

eruption on the pericardium, with a serous or hemorrhagic exudate; (2) in the form of a miliary eruption, but of a more chronic type, accompanied by fibrous synechiæ, but without effusion; (3) as a definite caseous process. The best pathologists and clinicians agree that a sanguineous effusion points strongly toward tuberculosis, although the effusion in malignant processes is also liable to be hemorrhagic. The myocardium may be involved secondarily or primarily, the former being the more common.

Wells challenges the view that there is a primary tuberculosis of the pericardium. He thinks that there is always a primary focus elsewhere in the body. The possible methods of infection of the pericardium are (1) Hæmatogenous, generally in the course of a miliary tuberculosis. (2) Lymphogenous, the bacilli coming through the lymph vessels either in the normal direction or with a reversed current. (3) Extension, in about the order of frequency, from mediastinal glands, pleura, myocardium, and vertebræ.

Infection of the pericardium is considered much more common by way of the lymph stream than by the bloodvessels. Tuberculosis of lymphatic origin is generally most marked on the parietal pericardium; that of hæmatogenous origin affects most often the epicardium. From the pleura direct extension may occur as well as by the lymphatics. It is probable, however, that direct extension from the pleura, as from the lymph glands, is not so common as lymphatic transmission.

Wells states that there is no doubt but that tuberculosis of the pericardium may heal entirely. The disease may lead to the production of synechiæ and of the condition of adherent pericardium. He states that adhesion of the pericardial layer seems much less likely to cause serious cardiac disturbance when due to tuberculosis than when due to rheumatism.

The myocardium may be affected in two ways: by a fibrous interstitial process, or by direct growth of the tubercles into the heart walls. The interstitial myocarditis is much less extensive and serious than that which follows rheumatism. Myocardial tuberculosis may occur in several forms: 1. Miliary tubercles, generally in miliary tuberculosis. 2. Large tubercles, usually multiple, and at times reaching the size of a hen's egg. 3. Diffuse tuberculosis, extending through a considerable part of the myocardium, chiefly as fibrous tissue intermingled with nodular and caseous tuberculosis, very rare. 4. Interstitial myocarditis, with occasional tubercles scattered about in the fibrous tissue without caseation, also rare. A myocardial tuberculosis may heal. The condition of cardio-tuberculous cirrhosis of the liver occasionally occurs in tuberculous pericarditis. The lesions consist generally of a diffuse fibrous increase plus miliary or small nodular tubercles, but sometimes only diffuse sclerotic changes or fatty cirrhosis without tubercles.

As to the termination of tuberculous pericarditis healing is considered possible. Healing occurs only in cases that are subacute or chronic from the start. Wells states that while calcification of a tuberculous exudate is possible he has been unable to find a well-authenticated case in which this calcification has been shown to originate on a basis of tuberculosis. Death is the most usual termination. It may be due to interference with the heart in the stage of effusion, but usually it is due to the associated tuberculous lesions of other viscera. Tuberculous pericarditis is generally unaccompanied by any symptoms referable to the heart, and is almost always an autopsy finding.